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Diet quality is positively associated with indexes of muscle mass

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The causes of age-related loss of muscle mass and sarcopenia (loss of muscle mass and strength) are incompletely understood⁽¹⁾ but evidence suggests that diet may play a role in the conservation of muscle mass, potentially through effects on chronic inflammation which has been found to mediate muscle loss⁽²⁾. The aim of the current study was to assess associations between diet quality, according to three predefined diet quality scores (The diet quality index (DQI) and healthy diet indicator (HDI) and Mediterranean diet score (MDS)), and indexes of muscle mass^(3,4,5,6). All three scores have been associated with reduced mortality and focus on fruits and vegetable consumption and SFA. The DQI and HDI also include percentage total fat, PUFA, whole grains, carbohydrates, protein, Na and Ca whereas the MDS includes legumes, cereals, fish, dairy products, meat, and the ratio of mono- and poly to saturated fat^(3,4,5,6).

A cross sectional study among 2690 female twin pairs from the twins UK adult twin registry, aged 18–79 years was conducted⁽⁷⁾. Ethical approval was obtained from the St. Thomas's Hospital Research Ethics committee and informed consent obtained from all subjects. Body composition was measured using dual-energy X-ray absorptiometry. Indexes of muscle mass, % fat-free mass (FFM%) and fat free mass index (FFMI – lean mass in kg/height²), were compared between quartiles or quintiles of the diet scores after adjustment for age, physical activity, smoking, and for the FFMI for total body fat. Analysis was performed in SPSS version 16.0 (SPSS Inc, Chicago, IL).

Mean age was 48.2 years, mean FFM% was 61%, and mean FFMI was 15 kg/m². Indexes of muscle mass (FFM%) showed a trend with all three diet scores between the top and bottom quartile or quintile, with differences of FFM% of 0.7% for the MDS (P for trend = 0.012), of 1.1% for the HDI (P for trend = 0.001) and 0.2% for the DQI (P for trend = 0.417). For FFMI the corresponding differences were 0.2 kg/m² for the MDS (P for trend = 0.004), 0.3 kg/m² for the HDI (P for trend = 0.008) and 0.4 kg/m² for the DQI (P for trend <0.001).

	MDS					HDI					DQI				
	Q1 n 814		Q4 n 808		P for trend	Q1 n 808		Q4 n 448		P for trend	Q1 n 699		Q5 n 715		P for trend
	Mean	SE	Mean	SE		Mean	SE	Mean	SE		Mean	SE	Mean	SE	
FFM% ¹	60.8	0.21	61.5	0.21	0.012	60.9	0.21	62.0	0.28	0.001	60.8	0.23	61.0	0.22	0.417
FFMI ²	14.8	0.05	15.0	0.05	0.004	14.9	0.05	15.2	0.07	0.008	14.7	0.06	15.1	0.06	<0.001

FFM%, Fat-free mass (%); FFMI, Fat-free mass index (kg/m²) values are means and SE in quintiles 1 and 4/5 of the derived diet scores.

¹Adjusted for age, physical activity, smoking history.

²Also for total body fat (kg).

In conclusion, we observed significant positive associations between better diet quality and indexes of muscle mass in women. The greatest association was between the DQI and the FFMI and was equivalent to ≈ 3% of the population mean for FFMI, after having accounted for the effects of age, total body fat, physical activity and smoking. The findings from this study suggest that, in women, the quality of the diet may be important in maintaining fat free mass.

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